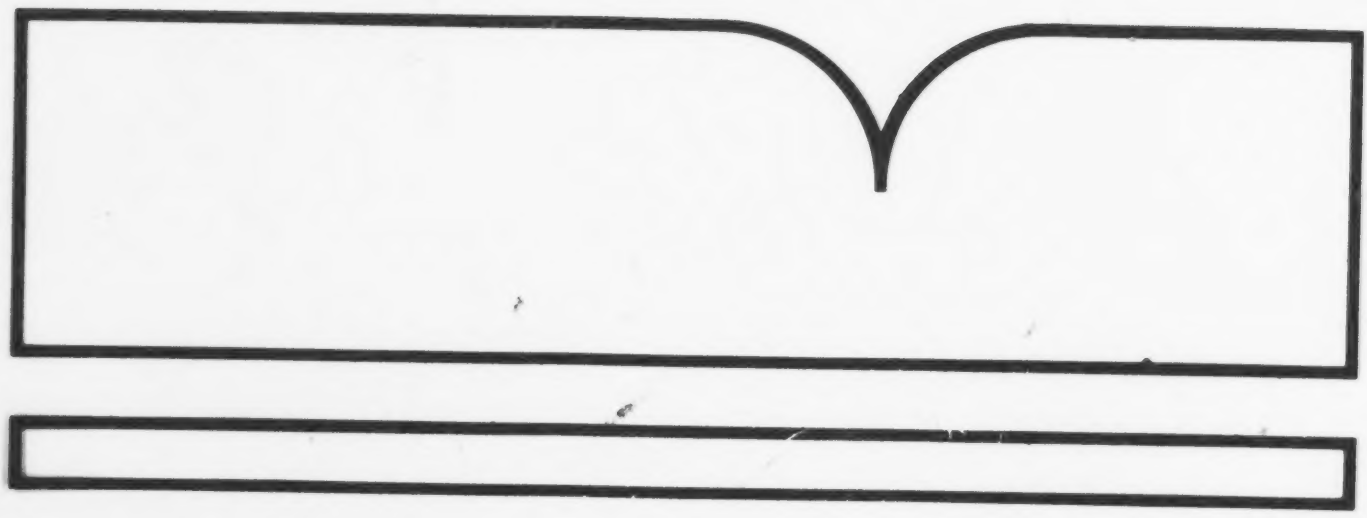
PB83-159913

Solicitation for Research Grant Proposals

(U.S.) Environmental Protection Agency
Washington, DC

Sep 82



U.S. Department of Commerce
National Technical Information Service
NTIS

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO. 600/8-82-027	2.
3. RECIPIENT'S ACCESSION NO. PB83 159913	
4. TITLE AND SUBTITLE Solicitation for Research Grant Proposals	5. REPORT DATE September, 1982
	6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) Office of Exploratory Research	8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS Office of Exploratory Research Office of Research and Development U.S. Environmental Protection Agency 401 M Street SW, Washington, DC 20460	10. PROGRAM ELEMENT NO.
	11. CONTRACT/GRANT NO.
12. SPONSORING AGENCY NAME AND ADDRESS same as block 9	13. TYPE OF REPORT AND PERIOD COVERED
	14. SPONSORING AGENCY CODE EPA/600/18

15. SUPPLEMENTARY NOTES

16. ABSTRACT

This solicitation describes the principal areas of interest and specific research needs and topics of the exploratory research grants assistance program. The six principal areas of interest are:

. Environmental Chemistry and Physics,
. Environmental Biology,
. Environmental Health,
. Environmental Engineering,
. Environmental Measurements, and
. Economic Benefits.

The solicitation also discusses eligibility and procedures for applying for a grant.

17. KEY WORDS AND DOCUMENT ANALYSIS		
a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES 25
	20. SECURITY CLASS *(This page)*	22. PRICE

EPA Form 2220-1 (Rev. 4-77) PREVIOUS EDITION IS OBSOLETE

United States
Environmental Protection
Agency

EPA-600/8-82-027
September 1982

Research and Development

PB83-159913

EPA

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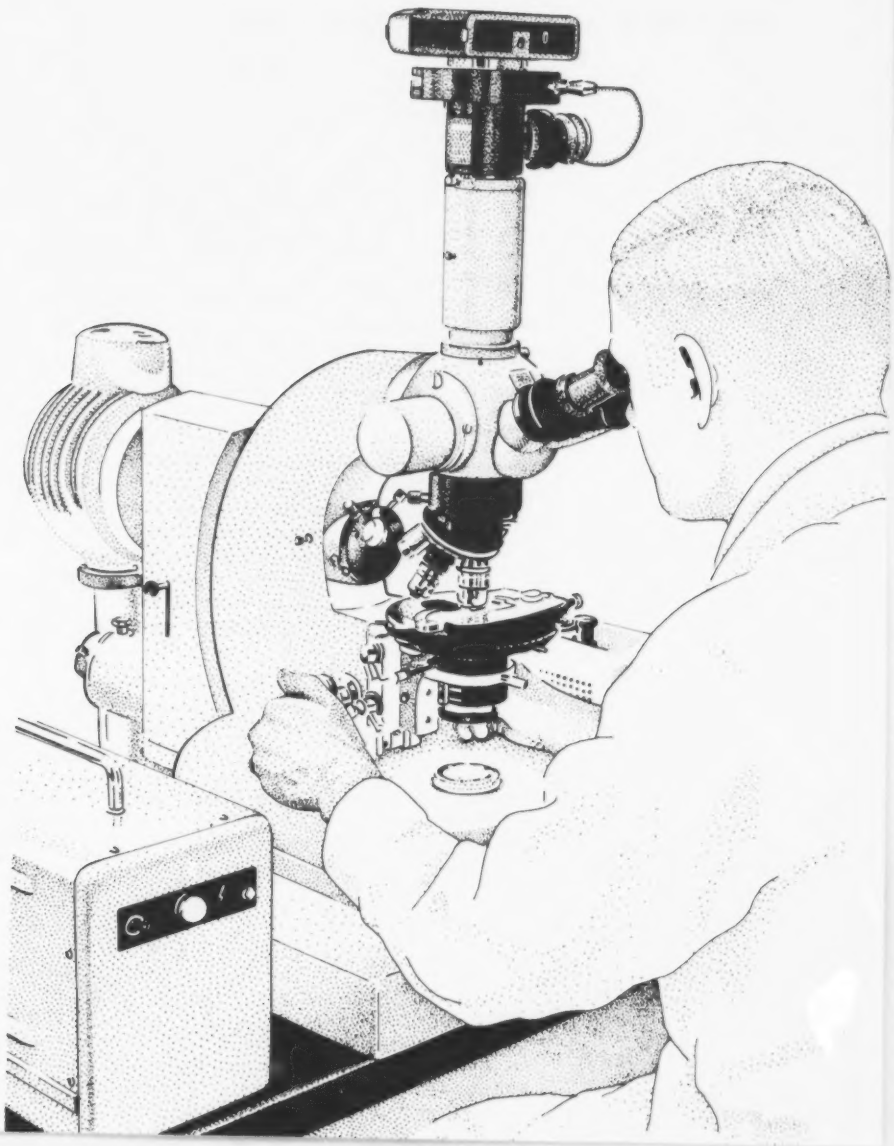

Solicitation for Research Grant Proposals

Introduction

The Environmental Protection Agency (EPA) is charged, through a series of laws and executive orders, with reducing air and water pollution and finding a comprehensive approach to solving other environmental problems associated with toxic and hazardous substances. The specific decisions on how best to accomplish these mandates require that a series of complex scientific, technical, economic, and political judgments be made. Clearly, the precision of environmental decisionmaking can be greatly enhanced by the availability of accurate scientific and technical data and accepted economic methodologies. Some of the chief responsibilities of EPA's Office of Research and Development (ORD) involve developing and assessing scientific and technical data and economic methodologies in order to refine the judgments which become the basis for environmental decisions.

Consequently, ORD supports environmentally related research, development, and demonstration efforts through its headquarters office in Washington, DC and its laboratories throughout the United States. In addition to the work conducted in its own facilities, EPA sponsors research elsewhere in the scientific and academic community—through cooperative agreements and negotiated contracts, for example.*

*Potential investigators should note that EPA has established a directed research program in the area of acidic deposition. (See Appendix A.) Those interested in cooperative agreements in this area should contact:

Acid Deposition Research Staff (RD 676)
Office of Research and Development
U.S. Environmental Protection Agency
Washington, DC 20460

Grants are another important means by which EPA underwrites research in the private sector. Participation in the research grants assistance program does not preclude individuals or institutions from engaging in EPA-sponsored research supported through cooperative agreements or contracts with ORD laboratories. Those interested in these aspects of EPA's research and development program are encouraged to consult directly with officials at the EPA laboratories. A list of these laboratories appears in Appendix B.

Long-Term Research

EPA has established a program to undertake long-term and anticipatory environmental research. The program, managed by ORD's Office of Exploratory Research, is comprised of two components: a series of environmental research centers (described in Appendix C), and a grants assistance program which supports individual investigators.

This solicitation describes the principal areas of interest and specific research needs and topics of the exploratory research grants assistance program. The six principal areas of interest are:

- Environmental Chemistry and Physics,
- Environmental Biology,
- Environmental Health,
- Environmental Engineering,
- Environmental Measurements, and
- Economic Benefits

Although this document emphasizes certain needs in six research areas, it is by no means all inclusive. Every scientifically meritorious proposal will be accorded full and fair consideration. Submissions from investigators at minority institutions and from those who have not previously submitted proposals are encouraged. The legislative and administrative limitations of this program require, however, that applications be germane to EPA's mission.

Eligibility

A research grant will be considered only if a fully developed proposal is submitted on the necessary Federal Assistance Application form, provided that:

1. the proposal project is for research (as opposed to development, demonstration, surveying, or preparation of materials and documents),
2. the proposed project directly pertains to EPA's mission, and
3. the grantee submitting the proposal is eligible to apply under the Federal laws that authorize EPA to award research grants.

Nonprofit institutions and state or local governments are eligible under all existing authorizations. Profit-making firms are eligible only under certain laws and then under very restrictive conditions. They may not realize any profit from the project and may be asked to contribute up to 25% of the project costs.

Potential applicants who are uncertain of their eligibility should study the restrictive language of the law governing the area of research interest. Such information is provided in the Research Grant Application/Information Kit.

All grantees must provide a minimum of 5% of the total project cost. These cost-sharing funds cannot be taken from other Federal sources. They may be in-kind or in-cash contributions.

Only fully-developed applications are eligible. Pre-proposals cannot be reviewed by the Office of Exploratory Research. Pre-proposals may, in certain instances, be reviewed by EPA laboratories, to determine whether the proposed effort is of interest to the Agency.

Application Procedures

Application forms, instructions and other pertinent, specific information are available in the EPA Research Grant Application/Information Kit. It is recommended that interested investigators review the material in this kit before preparing an application for assistance under this program. The Kits are available from:

Grants Operations Branch
Grants Administration Division (PM-216)
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, DC 20460

or

Office of Research Grants and Centers
Office of Research and Development (RD-675)
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, DC 20460

Fully-developed research proposals, prepared in accordance with instructions on a Federal Assistance Application Form (No. 5700-12), should be sent to:

Grants Administration Division (PM-216)
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, DC 20460

A pre-addressed mailing label is provided in the Application/Information Kit.

If this Solicitation is the basis for submitting a proposal, that fact may be entered in line 3 of the application form 5700-12.

One copy of the application with original signatures plus eight copies are needed. Informal, incomplete, or unsigned proposals cannot be considered by the research grants program.

Applicants who prefer to discuss research projects with Agency officials or who wish to submit a pre-proposal are encouraged to contact an EPA laboratory responsible for the program of interest. Their assistance may be requested on substantive matters for any proposed project—whether it is for a grant or cooperative agreement. Pre-proposals or pre-application letters of interest should not be sent to the Headquarters offices.

Although there are no deadlines for submitting research grant applications, it is recommended that submissions be made as early as possible in the fiscal year (which begins on October 1). Approved proposals require a minimum of six months to be funded.

Selection Process

All applications will initially be reviewed to determine their legal and administrative acceptability.

Acceptable applications will then be evaluated by the appropriate science peer review panel. (See Appendix D.) Where a proposal encompasses several disciplines, it will be reviewed by all the appropriate panels. This review is designed to evaluate and rank each proposal according to its scientific merit and recommend the acceptance or rejection of a proposal. Each peer review panel is composed primarily of non-EPA scientists who are acknowledged experts in their respective disciplines.

The Panels use the following criteria in their deliberations:

- Quality of research plan (including experimental design, originality and creativity)
- Qualifications of prinicpal investigator and staff
- Potential contribution to scientific knowledge
- Availability and adequacy of suitable facilities and equipment
- Budgetary justification

Proposals which receive the Panel's approval based on scientific merit are further evaluated by appropriate EPA officials for their relevance to the Agency's missions and Congressional appropriations.

Applicants are notified of the results of the review process as soon as possible. A summary of reviewers' comments will be provided to each applicant upon request.

Environmental Chemistry and Physics

Environmental chemistry and physics research involves understanding the basic processes by which pollutants are transported, transformed, degraded, or otherwise distributed in all environmental media including model representations which describe structure and the functional relationships, the ability to predict the fate and impact of toxic and hazardous chemicals, and concepts for predicting the fate and effects of chemicals from their basic molecular structure.

The high priority research needs in this area can be subdivided into air and all other routes for the movement of pollutants.

Research on Air

- Development, refinement, and validation of air quality models applicable to urban, meso, and regional scales, and for short and long time periods.
- Improvement of methods which use statistical procedures for evaluating, validating and comparing the performances of air quality simulation models of all kinds.
- Development and application of advanced tracer techniques to dispersion models so that the distribution of air pollutants from specified sources can be better defined.
- Synthesis of advanced tracer techniques and receptor modeling methods.
- Studies on the distribution, chemical, and physical transformations of toxic and hazardous compounds (and their intermediates) in ambient air, including sampling and analysis to support such studies.
- Development of new receptor model techniques, as well as improved measurement methods for attaining better source and ambient characteristics which are employed in these models.

For further procedural information in this area, please contact:

Robert Papetti
Office of Research and Development (RD-675)
U.S. Environmental Protection Agency
Washington, DC 20460
(202) 382-5741

Research on Freshwater, Marine/Estuarine Waters, Soils and Sediments

- Development of new theories or concepts to:
  (a) increase analytical sensitivity particularly for the identification and quantification of toxic elements,
  (b) separate and concentrate non-volatile organics sorbed to other materials,
  (c) identify and quantify multi-component non-volatile organics in soil, water, and sediments, and
  (d) identify and quantify absorbed or complexed inorganic species and measure the complexing agents.
- Studies of transport and transformation processes in the surface and subsurface environment in order to predict the impact of surface conditions on groundwater systems and for the design, control or clean-up of hazardous waste disposal sites, landfills, waste lagoons, and land treatment operations.

For further information of a procedural nature in this area, please contact:

Louis Swaby
Office of Research and Development (RD-675)
U.S. Environmental Protection Agency
Washington, DC 20460
(202) 382-5741

Environmental Biology

Environmental biology involves the examination of effects of pollutants and pollution abatement practices on ecosystems and their components, as well as the environment as a whole.

The high priority research needs in this area can be divided into three broad categories.

Ecosystem Assessment

- Studies of methodologies for the field measurement of ecosystems, and their characteristics, which will lead to a better understanding of the impacts of pollution and the avoidance of irreversible damage.
- Exploration of the biological and physical processes mediating sediment-water interactions and their associations with the deposition and release of pollutants.

Toxicity in Ecological Systems

- Studies of the dispersal of pollutants into aquatic and terrestrial ecosystems, including
  (a) Screening methods for predicting fate and toxicity of chemicals based upon structure and physical-chemical properties;
  (b) Methods to reliably determine the *in situ* effects on the environment of broad-scale pesticide use; and
  (c) Methods for the biological monitoring of ocean disposal operations in order to identify potential environmental hazards.

Ecological Genetics and Biotechnology

- Genetic studies on organisms which are designed to degrade specific hazardous substances and potential of these organisms for affecting the environment.

For further procedural information in this area, please contact:

Harold W. Wolf or Rufus Morison
Office of Research and Development (RD-675)
U.S. Environmental Protection Agency
Washington, DC 20460
(202) 382-5744
or
(202) 382-5741

Environmental Health

Environmental health research involves utilizing short-term *in vitro* studies, acute and chronic animal toxicology, controlled human exposure, and epidemiology to determine whether or to what extent exposure to pollutants contributes to health effects.

The following have been identified as high priority research needs in this area:

- Investigations using a holistic approach to the study of chemical and physical agents focusing on agents route and fate in the organism, and the effect of agents on the whole organism as well as target organs, including, for example:
  (a) Behavioral, neurophysiological, and reproductive effects studies;
  (b) Pharmacokinetic and immunologic studies; and
  (c) Synergistic and addictive effects studies of appropriate combinations of pollutants.
- *In vivo* and *in vitro* studies for developing rapid, reproducible, and sensitive screening tests to assess potential toxicity of environmental pollutants, including, for example:
  (a) Better human assays of exposure including biochemical, behavioral, and neural;
  (b) Assays for important classes of chemicals relevant to humans; and
  (c) The extrapolation of animal data to man.
- Epidemiological investigations that will improve the information base on the long-term effects (such as cancer and chronic degenerative diseases) associated with low level exposures to pollutants, including for example:
  (a) Population studies of subtle effects rather than mortality; and
  (b) Studies of the effects of pollutants on sensitive populations.

For further procedural information in this area, please contact:

George R. Simon or Clyde Bishop
Office of Research and Development (RD-675)
U.S. Environmental Protection Agency
Washington, Dc 20460
(202) 382-5744

Environmental Engineering

Environmental engineering research involves multimedia (solid, liquid, gaseous) pollution control processes associated with hazardous material and energy production as well as with conservation, increased efficiencies, recycling, and reuse.

The following have been identified as high priority research needs in this area:

- Studies of the reaction kinetics, by-products identification, and reaction mechanisms of drinking water and wastewater disinfection alternatives to chlorine.
- Determination of the potential of chemicals for leaching from materials and surfaces (e.g., pipe materials, protective coatings) intended for contact with drinking water, as a result of interaction of microorganisms, instability, disinfection agents, and other water treatment chemicals.
- Fundamental studies on the surface properties of sludges and the means for controlling those properties; the relationship of molecular structure of sludge constituents to the performance of biological sludge stabilization processes; and techniques for predicting sludge thickening and dewatering performance.
- Studies on biotechnology, including genetic engineering, to improve the efficiency of biological wastewater treatment processes for phosphorus removal, nitrification, and anaerobic sludge digestion.
- Studies on the control of hazardous solid wastes, including:
  (a) Detoxification, solidification, or other methods of fixing organic wastes before disposal;
  (b) Compatibility of soils and various liners with organic chemical wastes;
  (c) Stability of containment mechanisms,
  (d) Biotechnology applications and control of selected hazardous wastes;
  (e) Advanced systems of destruction, including thermal, chemical, and physical methods;
  (f) Decontamination of soils, solid residues, and aquifers.
- Studies of the conversion of volatile organic compounds to non-reactive, non-toxic compounds.

For further procedural information in this area, please contact:

Donald Carey
Office of Research and Development (RD-675)
U.S. Environmental Protection Agency
Washington, DC 20460
(202) 382-5741

Environmental Measurements

Environmental measurement research involves methods, techniques and devices needed to identify and measure levels of pollutants and to monitor them in numerous situations.

The following have been identified as high priority research needs in this area:

- Development of methods and procedures for more rapid, efficient and effective means for:
  - (a) Identification and quantification of toxic chemicals and the levels at which they occur in the environment;
  - (b) Separation and concentration of non-volatile organics sorbed to other materials;
  - (c) Identification and quantification of multi-component non-volatile organics in soil, water and sediments;
  - (d) Identification and quantification of absorbed or complexed inorganic species and measurement of the complexing agents;
  - (e) Monitoring of wastewater and drinking water treatment processes;
  - (f) Monitoring air pollutants in stacks;
  - (g) Continuous monitoring of individual toxic and criteria pollutants in air.

For further procedural information in this area, please contact:

Louis Swaby
Office of Research and Development (RD-675)
U.S. Environmental Protection Agency
Washington, DC 20460
(202) 382-5741

Economic Benefits

The development and validation of methods for measuring economic benefits will assist in implementing Executive Order 12291 and in evaluating the effectiveness of environmental control programs.

The following have been identified as high priority research needs in this area:

- Studies to advance the methodology for quantifying benefits.
- Development and validation of improved methods for using contingent valuation or other similar techniques.
- Development and validation of improved econometric methods for determining the economic benefits of reduced health damages resulting from various pollution control measures, distinguishing them from other major health-related factors such as medical care, diet, smoking, and exercise.

For further procedural information, please contact:

Alan Carlin
Office of Research and Development (RD-675)
U.S. Environmental Protection Agency
Washington, DC 20460
(202) 382-5716

Appendix A: Acid Deposition Research

EPA has had a significant role in the national program to understand the causes and effects of acid deposition since the late 1970s. All of the Federal activities in acid deposition are coordinated by an Interagency Task Force that has produced a *National Acid Precipitation Assessment Plan*, dated June 1982. Copies of the plan are available from:

Executive Director
Interagency Task Force on Acid Precipitation
722 Jackson Place, N.W.
Washington, DC 20006

Because the Acid Precipitation program is a government-wide effort, the nine broad research categories are directed from several agencies. Table 1 shows the lead agency and individual for each category of research as well as EPA's representative. During FY 1983 most of EPA's responsibilities will be shifted to field laboratories for in-house and extramurally funded projects.

The overall coordinating role within EPA is carried out by the Office of Exploratory Research. For general inquiries contact:

Acid Deposition Research Staff (RD-676)
Office of Research and Development
U.S. Environmental Protection Agency
Washington, DC 20460
(202) 426-5494

Table 1
National Acid Precipitation Assessment
Program Organization

Research Category and Lead Agency	Responsible Individuals: Coordinator	Responsible Individuals: EPA Representative
A. Natural Sources National Oceanic and Atmospheric Administration (NOAA)	Dr. Daniel Albritton NOAA Environmental Research Laboratory 325 Broadway Boulder, CO 80303	Dr. David Bennett USEPA (RD-676) Acid Deposition Research Staff Washington, DC 20460
B. Man-made Sources Department of Energy (DOE)	Mr. David J. Beecy Acting Director, Planning Division Office of Fossil Energy (FE-50) USDOE Washington, DC 20545	Mr. David Mobley (MD-61) USEPA Industrial Environmental Research Laboratory Research Triangle Park, NC 27711
C. Atmospheric Processes National Oceanic and Atmospheric Administration (NOAA)	Dr. John Miller Deputy Director, Area Resources Laboratory 8060 13th Street Silver Spring, MD 20910	Dr. Ken Demerjian (MD-80) USEPA Meteorology and Assessment Division Research Triangle Park, NC 27711
D. Deposition Monitoring Department of the Interior (DOI)	Dr. R. J. Pickering Chief, Water Quality Branch U.S. Geological Survey National Center, Stop 412 Reston, VA 22092	Dr. Peter Finklestein (MD-56) USEPA Environmental Monitoring Systems Laboratory Research Triangle Park, NC 27711
E. Aquatic Impacts U.S. Environmental Protection Agency (USEPA)	Dr. Raymond Wilhour USEPA Environmental Research Laboratory 200 SW 35th Street Corvallis, OR 97333	Dr. Raymond Wilhour USEPA Environmental Research Laboratory 200 SW 35th Street Corvallis, OR 97333
F. Terrestrial Impacts Department of Agriculture (DOA)	Dr. Leon Dochinger Research Plant Pathologist P.O. Box 365 359 Main Street Delaware, OH 43015	Dr. Raymond Wilhour USEPA Environmental Research Laboratory 200 SW 35th Street Corvallis, OR 97333
G. Effects on Materials Department of the Interior (DOI)	Dr. Raymond Herrmann Chief, Water Resources Field Support Labortory U.S. National Park Service 107 C Natural Resources Colorado State University Fort Collins, CO 80523	Mr. John Spence (MD-84) USEPA Environmental Sciences Research Laboratory Research Triangle Park, NC 27711
H. Control Technologies U.S. Environmental Protection Agency (USEPA)	Dr. Kurt Riegel USEPA (RD-681) Acid Deposition Research Staff Washington, DC 20460	Dr. Kurt Riegel USEPA (RD-681) Acid Deposition Research Staff Washington, DC 20460

Appendix B: Laboratories of the Office of Research and Development, USEPA

Health Effects Research Laboratory
Research Triangle Park, NC 27711

Environmental Monitoring Systems Laboratory
P.O. Box 15027
Las Vegas, NV 89114

Municipal Environmental Research Laboratory
Cincinnati, OH 45268

Environmental Research Laboratory
South Ferry Road
Narragansett, RI 02882

Environmental Monitoring Systems Laboratory
Research Triangle Park, NC 27711

Environment Research Laboratory
Sabine Island
Gulf Breeze, FL 32561

Industrial Environmental Research Laboratory
Cincinnati, OH 45268

Environmental Monitoring and Support Laboratory
Cincinnati, OH 45268

Environmental Research Laboratory
200 SW 35th Street
Corvallis, OR 97333

Environmental Research Laboratory
College Station Road
Athens, GA 30613

Environmental Research Laboratory
6201 Congdon Blvd.
Duluth, MN 55804

Environmental Sciences Research Laboratory
Research Triangle Park, NC 27711

Industrial Environmental Research Laboratory
Research Triangle Park, NC 27711

Robert S. Kerr Environmental Research Laboratory
P.O. Box 1198
Ada, OK 74820

Appendix C: Environmental Research Centers

EPA has established, by cooperative agreements, eight research centers at competitively selected universities. These are listed in Table 1.

The basic purposes of the centers are:

- to establish a focal point for continuing research in specific areas fundamental to environmental sciences;
- to apply the skills of the best available researchers to the solution of environmental problems;
- to provide a setting wherein support from both government and industry can be applied cooperatively in research of mutual interest; and
- to provide both regional and national resources for study of present and emerging problems in environmental protection.

The focus of the center programs is generally on long-term (3-5 years or longer) research which links basic to applied research as related to EPA's mission. The intent of EPA in employing the center mechanism is to integrate and build upon expertise and resources which are already developed within the institution. Center programs are expected to provide a capability and potential for accomplishments greater than those possible through the support of individual projects alone.

Centers are supported primarily through institutions or organizations with well established expertise and capability in a specified research area and a demonstrated commitment to such research. Support, therefore, requires moderate staff increases and limited additional investments in facilities and equipment.

Centers and their programs provide a multimedia and multidisciplinary orientation, either by virtue of the expertise available on the center staff or by arrangements with the parent institution, other institutions, or individuals. Centers can be based within a single institution or within a consortium. Centers have a firm foundation within the institution and a common interest in the public need as perceived by EPA and its advisors. This commonality of interest is to be shared by leaders within the institutions and EPA.

Center programs are closely linked with the long-term research needs identified by all EPA laboratories and program offices whose activities are related to the center objectives. Centers will therefore become, as intended, EPA-wide resources reflecting broad and related interests rather than extending the capability of a single EPA laboratory or program office.

The scope of the center activities includes:

- extending the capabilities of EPA laboratories within a given research area;
- filling research gaps and addressing areas requiring expansion;
- stimulating EPA's applied research program by infusion of a broader based approach;
- providing a bridge between EPA and the scientific/industrial community; and
- serving as a source of new talent within environmental scientists through involvement of junior and senior scientists in center activities.

In general, center resources are not to be used to augment support for ongoing projects within the purview of the center staff. Likewise, center resources are not generally to be used to augment ongoing EPA short-term or applied programs. Exception to these restrictions may occur, for example, if an ongoing program is long-term, fills an objective of the center, and requires a substantially expanded effort.

Twice per year, programmatic guidance is provided to each center by a policy board composed of representatives from all EPA offices having an interest in the center theme.

Table 1.
Long-Term Environmental Research Centers

Epidemiology Research Center
University of Pittsburgh
Dr. Edward T. Radford, Director

Advanced Environmental Control Technology Center
University of Illinois, Urbana
Dr. R. S. Englebrecht, Director

National Center for Ground Water Research
Consortium of:

University of Oklahoma, Norman
Dr. Larry Canter, Director

Oklahoma State University, Stillwater
Dr. Norman N. Durham, Director

Rice University, Houston
Dr. C. H. Ward, Director

Industrial Waste Elimination Center
Consortium of:

Illinois Institute of Technology, Chicago
University of Notre Dame, South Bend
Dr. James W. Patterson (IIT), Director

National Intermedia Transport Research Center
University of California, Los Angeles
Dr. Sheldon K. Friedlander, Director

Ecosystems Research Center
Cornell University, Ithaca
Dr. Simon A. Levin, Director

Marine Sciences Research Center
University of Rhode Island
Dr. Michael E. Q. Pilson, Director

Hazardous Waste Research Center
Louisiana State University
Dr. Elvin J. Dantin, Director

Appendix D. Science Peer Review Panels

Grants proposals received by the Office of Exploratory Research are assigned for review to one or more of the following panel chairmen according to the subject matter of the proposal.

Environmental Biology	chaired by: Dr. Robert Beyers University of South Alabama Mobile, Alabama
Environmental Chemistry/Physics, Water	chaired by: Dr. James Butler Harvard University Cambridge, Massachusetts
Environmental Chemistry/Physics, Air	chaired by: Dr. Jack Calvert National Center for Atmospheric Research Boulder, Colorado
Environmental Engineering/Pollution Control Processes	chaired by: Dr. Richard Chaddock Consultant Port Orange, Florida
Environmental Health	chaired by: Roger Detels, M.D. University of California Los Angeles, California
Economic Benefits	chaired by: To Be Assigned

Panel chairpersons are appointed by the Assistant Administrator for Research and Development for a period not to exceed three years. Upon receipt of proposals assigned to each panel, the panel chairperson, in consultation with the appropriate EPA science review administrator, solicits at least two primary reviewers.

In preparation for any one panel meeting reviewers are selected from an extensive list of approved reviewers. This list is available from the Office of Research Grants and Centers upon request. The size of each panel meeting and the identity of its members depend on the number of proposals received and the specific expertise required for review.

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EPA-600/8-82-027

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